a convenient formula and rule lately devised by Doctor Hellmann by which one may convert centigrade to Fahrenheit, or vice versa, with the least possible trouble. Ordinarily we say that one degree on the centigrade scale is nine-fifths of one degree on the Fahrenheit scale, but the multiplying by nine and dividing by five is awkward, and Doctor Hellmann simply substitutes eighteen-tenths for nine-fifths, and then instead of this writes 2 — 2/10. In this way any number of degrees on the centigrade scale is converted to the equivalent number on the Fahrenheit scale by first multiplying by two and then subtracting from this product one-tenth part of itself; for example, 17 centigrade is 34 — 3.4 = 30.6. Fahrenheit. Some may prefer to modify the operation as follows: From the original number subtract one-tenth of itself and then multiply by two. Thus 17 C. — 1.7 = 15.3, which multiplied by 2 equals 30.6. We have still to add 32°, making in all 62.6°, in order to get the temperature on the Fahrenheit scale.

The conversion from Fahrenheit to centigrade, according to Hellmann's rule, is not quite so simple, as he writes the formula as follows: $(\frac{1}{2} + \frac{1}{2} \cdot \frac{1}{10} + \frac{1}{2} \cdot \frac{1}{100}$, etc.) (F.— 32). The first factor in the parenthesis is equivalent to 0.5555 + = 5/9. For most persons it is easier to divide by 2 than to multiply by 5, and the formula may be written

$$C. = \tfrac{1}{2}\ (F. - 32)\ (1 + \tfrac{1}{10} + \tfrac{1}{100} + \tfrac{1}{1000}\ \text{etc.},) = \tfrac{1}{2} \cdot \tfrac{10}{9} (F. - 32).$$

The computation is made as in the following example: $\frac{1}{2}(62.6 - 32) = 15.3$; and $15.3 + 1.53 + .153 + .0153 + .00153 = 16.99983 +$, or 17.0.

Probably this and other methods have already been used by persons in England and America.

METEOROLOGICAL WORK AT CAMP WELLMAN, DANES ISLAND, SPITZBERGEN.

The Wellman Chicago Record-Herald Polar Expedition was organized about the first of January, 1906, to carry out Mr. Walter Wellman's plan of reaching the North Pole by means of an air ship or dirigible balloon.

Mr. Henry B. Hersey, Inspector, U. S. Weather Bureau, having volunteered for the service, was assigned by Prof. Willis L. Moore, Chief of the Bureau, to accompany the expedition as meteorological observer. He was also appointed by the National Geographic Society of America to act as the representative of that organization with the expedition. About May I, 1906, Mr. Hersey accompanied Mr. Wellman to London and Paris, assisting him in the organization of the work and the assembling of the equipment. A little later he was appointed executive officer of the expedition, second in command. This appointment was accepted and Mr. Hersey was directed to take charge of the first section, sailing from Tromsoe, Norway, to Danes Island, Spitzbergen, with the force and material for the erection of the living quarters, workshop, balloon house, and gas plant. This section of the expedition was made up of eighteen men and sailed from Tromsoe June 15 on the steamer *Frithjof* and arrived at Danes Island on the 21st.

The meteorological instruments were landed and put in position on June 25, 1906, and regular observations began on the 26th. The outfit consisted of standard U. S. Weather Bureau maximum, minimum, and dry thermometers, also a whirling hand psychrometer (a sling psychrometer), consisting of dry and wet-bulb thermometers on one support. There were also a standard Weather Bureau anemometer and single register, a Richard thermograph, an aneroid barometer, and a Richard meteorograph, recording temperature, barometric pressure, humidity, and wind velocity. The thermometers were installed in a latticework shelter of standard Weather Bureau pattern (small size).

The anemometer was first put up on a pole, attached to a building known as Pike House, at an elevation of about 38 feet above the ground and 46 feet above sea level, and back about 70 feet from the water front of Virgo Harbor. The thermometer shelter was erected on a little knoll about 150 feet west of Pike House and about 70 feet back from the water front.

The exposure of the thermometers was entirely satisfactory, but that of the anemometer was poor. About 200 yards south of Pike House there is a steep hill rising to over 300 feet in height, and to the west about 600 yards another ridge of hills about 500 feet high; to the northwest across the strait, or Dans Gat, as it is called, Amsterdam Island rises to a height of about 500 feet. To the east and northeast the exposure is open to the wind.

No standard rain or snow gage was used, but the amount of precipitation was estimated or approximately measured in an improvised tin-can gage by Mr. Hersey, and as he has had more than twenty years' experience in meteorological work and his estimates were carefully made, his figures may be considered approximately correct.

The latitude and longitude of the station were determined by Mr. Hersey and Mr. Felix Riesenberg, assistant scientific observer of the expedition, to be as follows: latitude 79° 43′ north, and longitude 11° 9′ east from Greenwich. The time used in the records of the station is one hour faster than Greenwich.

On July 5 the steamer *Laura*, a private steamer with a hunting party on board, stopt in the harbor. She had on board a mercurial barometer which was being sent from the observatory at Christiana to Jan Mayen Island for use in meteorological work there. It appeared to be in good condition, and the aneroid in use at this station was compared with it and found to agree closely. On July 11 the barometer was moved to the new Wellman House, about 300 yards northwest of Pike House. This made a change in the elevation of the barometer from about 12 feet to about 25 feet above sea level.

August 10 the anemometer was moved from Pike House to the top of the frame work of the gas apparatus, near Wellman House. This made a change in the height of the cups above the ground from 38 to 40 feet and above sea level from 46 to 54 feet. The exposure was somewhat improved by the change.

August 18 the thermometer shelter was moved from near Pike House to a new location near Wellman House, about 300 yards northwest of its former site. A good exposure was obtained.

August 19 a standard U. S. Weather Bureau 4-foot wind vane was erected on top of Mount Moore, about 400 yards southwest of Wellman House, and at an altitude of about 500 feet above sea level. This gave an excellent exposure for obtaining the true direction of the wind.

DAILY METEOROLOGICAL JOURNAL FROM JUNE 21 TO AUGUST 31, 1906.

June 21.—Expedition arrived on steamer *Frithjof* and dropt anchor in Virgo Harbor at 7 p. m., after a hard fight thru the heavy ice in Dans Gat. Snow flurries prevailed thruout the day and following night.[1] Estimated snowfall at 6 p. m., 3.0 inches. Temperature below freezing all day. Dans Gat and harbor full of heavy pack ice.

June 22.—Snowing all day with a brisk northwest wind. Snowfall, 2.0 inches. Below freezing all day.

June 23.—Another day of snow flurries, but not so heavy. Snowfall, 1.0 inch. Freezing all day.

[1] The terms "night", "evening", "morning", are apparently used to designate the periods to which they are applied in the United States; it is plausible that the term "night" is used for the period during which the men were sleeping and no note was taken of weather conditions. At latitude 79° 43′ the sun would remain above an unobstructed horizon from about April 14 to about August 29, while twilight would not give way to full darkness till after the autumn equinox. See also the entry of August 27.

June 24.—Light snow flurries at intervals. Very little wind. Snowfall, 0.5 inch. Freezing all day.

June 25.—Snow flurries all day; wet, sticky snow. Light northerly winds. Snowfall, 3.0 inches for the twenty-four hours ending 6 p m. Freezing all day. Meteorological instruments erected and put in order to-day.

June 26.—Occasional snow flurries, with light northerly winds. Snow was light and feathery and the sun broke thru the clouds at intervals. Snowfall at 6 p. m., 0.2 inch melted. Meteorological instruments all working to-day.

June 27.—Slight trace of snow in the morning followed by partly cloudy and pleasant weather all day. Fresh to brisk east to northeast wind. This wind began to clear the heavy ice floes out of the strait or Dans Gat, as it is called, and opened a channel from Smeerenberg Bay westward to the ocean.

June 28.—Partly cloudy, with bleak northeast wind all day. The clouds were low and hung over the mountain tops, giving light snow flurries over some of the mountains.

June 29.—Partly cloudy, with bleak north to northeast wind all day. Snow flurries in the mountains. Cold, penetrating wind.

June 30.—Not quite so cold. Partly cloudy, with fresh to brisk northerly winds in the forenoon; cloudy in the afternoon, with northeast winds. Barometer falling slowly until about 5 p. m., when it became stationary. Threatening weather in the evening.

July 1.—The warmest day experienced so far. Light rain from 9 to 11 a. m. Fresh to brisk northeast wind. Snow melting rapidly and the floe ice in Virgo Harbor becoming spongy. The Gat opened from the east side of Smeerenberg Bay westward to the ocean. Ice still solid in Smeerenberg Bay south of Gat.

July 2.—A remarkably pleasant, mild day. Clear weather with light easterly wind. Snow and ice melting rapidly.

July 3.—It was nearly calm from midnight until 2:45 a. m. when a fresh southerly breeze sprung up, continuing with varying force all day and becoming brisk southwest late in the afternoon. Cloudy all day, with a few drops of rain about 8:30 a. m. Ice all drifted out of Virgo Harbor, except a couple of large floes which were aground. Snow and ice melting rapidly.

July 4.—Cloudy all day, with fresh to brisk southwest wind. Light rain, 11:40 a. m. to 12:10 p. m. Ice and snow melting fast.

July 5.—Cloudy all day, with light rain at intervals. Brisk southerly wind until about 5 p. m. when it became light and variable. Barometer falling slowly in the afternoon.

July 6.—Cloudy all day, with light, misty rain from 12:30 p. m. to 5:30 p. m. About calm from early morning until 11:30 a. m. when a fresh southerly breeze sprung up; this veered to southwest about 1:30 p. m. Estimated rainfall about .04 inch. The barometer rose all day and the temperature fell a little. Ice and snow continued to disappear rapidly.

July 7.—Clear, mild weather until night when it became cloudy. Brisk southerly wind until 7 p. m. when it became light and shifted to northwest. Barometer falling steadily all day.

July 8.—Cloudy until about 8 p. m. when it partially cleared. Brisk southerly wind until noon when it became light and variable. Falling barometer in the evening.

July 9.—Quite warm in the morning with light to fresh easterly wind; cloudy in the afternoon with brisk southwesterly wind. Trace of rain from 5:50 p. m. to 8:30 p. m.

July 10.—Cloudy, mild weather all day. Light to fresh easterly wind.

July 11.—Cloudy with low fog on the mountains. Light rain from 10 a. m. to 12:50 p. m. Light to fresh southerly wind.

July 12.—Mild, cloudy weather in the forenoon with mild southerly wind. Temperature fell in the afternoon and wind became variable in direction. Trace of rain at intervals in the afternoon and a few flakes of snow about 6:20 p. m.

July 13.—Cloudy and mild with light northwest wind. The wind became brisk in the afternoon from the north and northeast with partly cloudy weather; cooler at night.

July 14.—Generally clear weather with brisk northerly wind all day. Moderate temperature; barometer rising slowly.

July 15.—Clear weather with brisk north wind all day. Rising barometer.

July 16.—A very pleasant day. Clear weather with mild temperature and light northerly wind. Calm at times.

July 17.—Clear all day, almost calm in the morning, but brisk northerly wind in the afternoon. Very warm in the forenoon.

July 18.—Strong north wind in the morning. About 9 a. m. the wind became light and variable in direction. In the afternoon it changed to south and was brisk and gusty. Clear weather with mild temperature and rising barometer all day.

July 19.—Clear weather with brisk to high northeast wind all day, ranging from 20 to 25 miles most of the day. Falling barometer.

July 20.—Clear weather with brisk to high northeast wind till 2:30 p. m.; afterward it was light. The temperature was a little lower to-day and the wind was quite penetrating. The barometer remained nearly stationary at 29.86 inches.

July 21.—Clear with brisk to high north wind. During the afternoon it was not so high and the temperature rose to 50.0°. Slight fall in barometer.

July 22.—Generally clear weather all day. Light variable wind in the forenoon, followed by brisk northerly wind in the afternoon; light and variable again at night. A very pleasant day.

July 23.—Nearly calm in the morning with warm, partly cloudy weather. About 6 p. m. it became cloudy and a brisk south wind set in. Barometer fell steadily all day.

July 24.—Brisk to high southerly winds all day, rather puffy and variable in force. Partly cloudy in the morning, followed by foggy, cloudy weather in the afternoon. Barometer rose steadily all day.

July 25.—Cloudy with light southerly wind during the day, followed by clearing at night.

July 26.—Cloudy and nearly calm in the morning. Trace of rain 8:45 a. m. to 9 a. m. Brisk south breeze changed to west at noon and to north at 5 p. m. Barometer fell steadily all day.

Mr. Hersey left on the *Frithjof* at 5 p. m. for Red Bay, leaving Mr. Riesenberg in charge of the weather work.

July 27.—Mr. Hersey returned from Red Bay at 6 a. m.

A strong south wind sprang up about 2:20 a. m., reaching a velocity of 26 miles an hour at 2:30 a. m., and continued brisk until about 9 a. m., when it became light. Light rain began at 2:30 a. m. and continued at intervals until about noon, when it became moderately heavy and rained steadily the remainder of the day. This was the first rain of any importance which had occurred since the opening of the station. At 6 p. m. the rainfall amounted to .65 inch. This was measured in an improvised "tin-can" gage. Barometer rose slowly all day.

Mr. Hersey left at 9:30 p. m. on the *Frithjof* for Bell Sound, leaving Mr. Felix Riesenberg in charge of the meteorological work.

July 28.—Rain ended during the preceding night; amount .40 inch. Cloudy in the early morning but cleared late in the day. Light to fresh southerly winds all day. Slowly rising barometer.

July 29.—Clear weather, with light to fresh southerly wind.

July 30.—Partly cloudy, with brisk southwest wind.

July 31.—Partly cloudy in the morning followed by cloudy weather with light rain at intervals, continuing into the night.

Fresh southwest wind, blowing in squalls. Rainfall measured .10 inch.

August 1.—Cloudy and cooler, with light north to northeast wind. Light drizzling rain at intervals all day. Rising barometer.

August 2.—Fine and clear, with light, variable wind until 8:30 p. m., when it turned to south and became fresh by midnight.

August 3.—Bright, clear day, with brisk southwesterly wind until night, when it dropt to a light breeze and became variable.

August 4.—Fair and clear, with light, variable southerly wind; cloudy at night.

August 5.—Cloudy, with very light, variable wind all day.

August 6.—Cloudy and nearly calm most of the day.

August 7.—Clear, with brisk southerly wind. Barometer stationary all day.

August 8.—Nearly calm in the morning, with cloudy weather. About noon it cleared with light northerly wind. It was quite foggy at intervals during the afternoon, but became entirely clear again by 6 p. m. and continued clear all night.

August 9.—Clear, with light northwesterly wind all day.

August 10.—Cloudy, with light westerly wind in the forenoon shifting to north in the afternoon. Foggy in the forenoon.

August 11.—Fog in the morning. Clear, with fresh to brisk northerly winds all day.

August 12.—Clear, with fresh to brisk northerly wind in the morning. Cloudy in the afternoon, with light west to northwest wind. Light snow began at 8 p. m. and continued at intervals thruout the night. This was the first snow of any consequence since June 26. It melted about as fast as it fell.

August 13.—Light snow flurries continued at intervals all day, and at 6 p. m. the total for twenty-four hours was .22 inch, melted. It did not remain on the ground, melting almost as fast as it fell. Cloudy with light variable wind.

August 14.—Cloudy with light variable wind and occasional snow flurries. Precipitation, .12 inch.

August 15.—Cloudy with very light southerly wind. Light rain during the preceding night and a trace again at 1:30 p. m. Waterfowl leaving for the south.

August 16.—Cloudy with very light variable wind. Trace of rain about 6 p. m.

August 17.—Clear weather with light to fresh southerly wind. Falling barometer.

August 18.—Clear with light to fresh northerly wind. Falling barometer.

August 19.—Partly cloudy with light southeast wind in forenoon, cloudy with very light variable wind in afternoon. Warm and pleasant all day.

August 20.—Partly cloudy in the forenoon with light variable wind. Clear and nearly calm in the afternoon. Mild temperature and a delightfully balmy day.

August 21.—Clear weather with light variable wind.

August 22.—Partly cloudy with light variable wind. Light fog in the morning.

August 23.—Cloudy with light variable wind. Waterfowl nearly all gone south. A few guillemots, sea parrots, gulls, and eider ducks remain.

August 24.—Partly cloudy with light northeast wind.

August 25.—Cloudy with light to fresh southerly wind. Trace of rain during the preceding night. Steadily falling barometer.

August 26.—Trace of rain during the preceding night. Cloudy with fresh to brisk southerly wind until about 6 p. m. when it shifted to northeast and snow began to fall; this continued all night, accompanied by freezing temperature toward morning. For a short time about 6:20 p. m. the snow was very heavy. The ground being warm the snow melted about as fast as it fell.

TABLE 1.—*Record of observations at Camp Wellman, Danes Island, Spitzbergen, from June 21 to August 31, 1906. Observations taken by the observer personally at 6 p. m., 15th meridian, east.*

JUNE, 1906.

Day of month.	Barometer reading. (sea level.)	Thermometers. Dry.	Thermometers. Wet.	Wind. Dir.	Wind. Vel.	Precipitation—24 hours ending 6 p. m.	Character of day.*
	Inches.	°	°		*Miles.*	*Inches.*	
21						.30	Cloudy.
22						.20	Cloudy.
23						.10	Cloudy.
24						.05	Cloudy.
25						.30	Cloudy.
26		31.0	30.0	n.	8	.02	Cloudy.
27		31.5	30.5	nw.	6	T.	Pt. cloudy.
28		30.0	29.5	nw.	6	0	Pt. cloudy.
29		28.3	27.3	n.	9	0	Pt. cloudy.
30		33.0	32.0	nw.	7	0	Cloudy.

*Average condition during day.

JULY, 1906.

1	29.72	36.0	34.5	nw.	7	.03	Cloudy.
2	29.78	39.0	36.5	e.	6	0	Clear.
3	29.82	40.5	37.5	sw.	13	T.	Cloudy.
4	29.84	38.5	37.0	s.	16	T.	Cloudy.
5	29.75	38.0	37.0	s.	3	.06	Cloudy.
6	29.76	34.2	33.7	w.	6	.04	Cloudy.
7	29.93	39.0	37.0	s.	7	0	Clear.
8	29.92	38.0	37.0	n.	4	0	Cloudy.
9	29.80	44.0	41.0	sw.	2	T.	Cloudy.
10	29.76	42.5	40.0	e.	4	T.	Cloudy.
11	29.72	42.0	41.0	sw.	10	.01	Cloudy.
12	29.73	36.0	35.0	w.	5	T.	Cloudy.
13	29.87	37.5	35.5	ne.	11	T.	Cloudy.
14	29.89	40.0	37.5	n.	12	0	Clear.
15	30.03	38.0	36.5	n.	7	0	Clear.
16	30.09	43.0	40.0	ne.	8	0	Clear.
17	29.69	47.0	42.0	n.	12	0	Clear.
18	30.20	45.0	42.0	sw.	8	0	Clear.
19	29.97	39.0	38.0	n.	25	0	Clear.
20	29.86	37.0	35.5	ne.	17	0	Clear.
21	29.77	47.0	44.0	nw.	10	0	Clear.
22	29.75	43.5	41.5	nw.	18	0	Clear.
23	29.56	50.5	45.0	s.	14	0	Pt. cloudy.
24	30.01	45.0	43.0	sw.	12	0	Cloudy.
25	30.17	44.0	42.0	e.	8	0	Cloudy.
26	30.06	45.0	44.0	n.	5	T.	Cloudy.
27	29.97	41.0	41.0	s.	6	.65	Cloudy.
28	30.16	45.0	43.0	s.	4	.40	Clear.
29	30.17	47.0	45.0	sw.	4	0	Pt. cloudy.
30	30.09	42.0	41.0	s.	11	0	Pt. cloudy.
31	29.96	44.5	43.0	s.	4	.10	Cloudy.
Sums						1.29	
Means	29.90	41.6	39.6	s.	9		

*Average condition during day.

AUGUST, 1906.

1	30.03	36.0	35.0	nw.	3	.02	Cloudy.
2	30.10	39.0	38.0	s.	3	0	Clear.
3	29.92	43.0	41.0	sw.	11	0	Clear.
4	30.04	42.0	40.5	s.	3	0	Clear.
5	30.02	41.5	40.0	w.	2	0	Cloudy.
6	30.10	39.5	38.5	sw.	3	0	Cloudy.
7	30.13	40.0	38.5	sw.	6	0	Clear.
8	30.15	38.0	37.0	ne.	3	0	Pt. cloudy.
9	30.22	38.5	37.0	n.	5	0	Clear.
10	30.27	36.5	36.0	nw.	3	0	Cloudy.
11	30.20	38.0	36.5	n.	7	0	Cloudy.
12	30.16	37.0	36.5	sw.	3	0	Cloudy.
13	30.13	34.0	34.0	w.	3	.22	Cloudy.
14	30.17	34.0	34.0	s.	4	.12	Cloudy.
15	30.13	39.7	39.2	s.	2	.01	Cloudy.
16	30.10	40.3	40.3	s.	3	T.	Cloudy.
17	30.03	37.0	35.0	ne.	2	T.	Cloudy.
18	29.95	37.7	35.7	n.	6	0	Clear.
19	29.83	44.3	43.8	se.	1	0	Pt. cloudy.
20	29.81	44.0	42.0	ne.	2	0	Pt. cloudy.
21	29.80	38.0	37.0	w.	1	0	Clear.
22	29.88	38.5	37.0	sw.	1	0	Pt. cloudy.
23	30.02	37.0	35.0	w.	2	0	Cloudy.
24	30.11	36.5	35.0	ne.	3	0	Pt. cloudy.
25	30.02	36.5	35.0	sw.	5	T.	Cloudy.
26	29.84	36.0	36.0	ne.	4	T.	Cloudy.
27	29.96	31.7	30.2	ne.	15	.15	Cloudy.
28	29.89	31.5	31.0	ne.	12	.09	Cloudy.
29	29.84	32.0	32.0	w.	1	.15	Cloudy.
30	29.80	32.0	31.0	w.	6	.13	Cloudy.
31	29.80	30.7	30.7	w.	6	.65	Cloudy.
Sums						1.54	
Means	30.01	37.4	36.4	ne.	4		

*Average condition during day.

August 27.—Light snow thruout the preceding night and continuing all day with brisk to high northeast wind. Rising barometer and falling temperature, below freezing all day.

TABLE 2.—*Hourly temperatures from corrected thermograph readings at Camp Wellman, Danes Island, Spitzbergen, from June 21 to September 3, 1906. (Standard of time in local use, 15th meridian east.)*

JUNE.

Date.	A. M. 1	2	3	4	5	6	7	8	9	10	11	Noon.	P. M. 1	2	3	4	5	6	7	8	9	10	11	Mid't.	Sum.	Mean.	Maximum.	Minimum.
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30	30	30	30	28	30	30	30	28	27	27	27	.....	.....	.....	.....
22	28	28	28	28	28	27	27	28	28	28	28	28	28	28	28	28	28	30	28	28	28	28	28	28	672	28.0	30	27
23	28	28	28	28	28	28	30	28	28	28	28	28	30	30	30	30	28	28	30	30	28	28	28	27	685	28.5	31	27
24	27	27	27	27	27	28	28	28	28	28	28	28	32	30	32	30	28	30	28	28	28	28	28	27	680	28.3	32	27
25	27	27	27	27	28	27	28	32	33	30	30	30	30	30	30	30	28	30	30	30	30	32	32	32	708	29.5	33	27
26	32	30	30	28	30	30	30	32	28	28	30	32	30	30	30	30	31	31	32	30	30	28	27	27	716	29.8	32	27
27	28	28	28	28	28	28	28	28	28	30	30	30	30	30	30	32	32	32	32	32	32	30	30	30	714	29.8	32	27
28	28	28	28	30	30	30	33	35	35	35	35	35	35	35	35	32	30	30	28	30	28	30	28	28	751	31.3	35	28
29	28	30	30	30	28	28	28	28	28	27	27	27	27	27	27	27	27	28	28	28	28	28	28	30	672	28.0	30	26
30	30	30	30	30	30	30	28	28	28	28	34	34	32	32	34	32	32	33	34	34	34	34	34	34	759	31.6	34	28

JULY.

1	34	34	34	34	36	34	34	34	34	34	38	38	38	32	36	36	36	36	36	36	36	36	36	846	35.2	38	32
2	36	36	36	36	34	33	37	41	43	41	39	38	41	39	41	41	37	39	36	37	37	37	39	37	911	38.0	44	32
3	37	32	32	37	37	37	37	41	39	41	41	44	41	41	42	43	39	40	38	38	38	38	38	38	929	38.7	44	32
4	38	39	38	38	38	38	38	38	38	39	40	38	38	39	39	38	38	38	39	39	39	40	40	40	926	38.6	40	37
5	40	40	40	39	38	39	39	37	39	40	39	40	41	39	39	41	38	38	36	36	36	36	36	36	922	38.4	41	36
6	36	36	35	34	34	36	35	36	37	37	38	39	36	35	35	34	34	34	34	33	34	34	35	35	846	35.2	39	33
7	35	35	36	36	36	37	37	38	39	39	39	41	38	37	37	37	38	39	39	39	39	39	41	41	912	38.0	41	34
8	39	39	38	37	36	34	34	33	34	35	36	36	37	37	37	36	37	38	39	37	37	37	38	38	879	36.6	41	33
9	38	38	38	39	38	40	45	45	45	46	50	45	48	51	48	45	44	44	43	43	42	42	41	41	1039	43.3	51	38
10	39	41	41	40	40	39	40	43	43	45	45	46	43	41	40	41	43	42	42	41	41	42	42	39	999	41.6	47	39
11	43	41	39	39	40	39	39	39	39	41	41	42	42	42	42	42	42	42	41	41	41	41	40	40	978	40.8	44	39
12	40	41	40	40	40	40	40	40	40	40	39	39	39	38	38	37	36	36	35	34	35	35	35	35	912	38.0	41	34
13	35	36	36	36	36	36	38	36	37	37	37	37	37	37	40	39	38	38	37	37	38	39	39	41	897	37.4	41	35
14	40	40	40	40	44	41	39	39	36	36	36	36	36	37	39	40	41	40	40	40	40	40	40	43	943	39.3	44	36
15	43	43	43	44	43	42	43	43	43	41	40	39	39	38	37	37	38	38	36	36	37	37	39	39	958	39.9	44	36
16	40	39	39	41	41	41	41	42	43	44	48	43	42	50	50	48	46	43	45	45	42	45	46	46	1050	43.8	51	38
17	43	46	46	49	46	48	46	50	50	50	54	47	47	47	46	48	47	47	47	46	46	44	44	42	1126	46.9	54	42
18	42	41	38	39	39	38	42	39	41	40	42	49	51	47	46	46	46	45	44	42	42	41	40	40	1020	42.5	51	38
19	39	39	38	38	40	40	44	44	45	40	41	41	39	40	39	38	40	39	40	42	41	42	43	43	975	40.6	45	38
20	40	40	41	41	41	38	38	38	38	37	38	38	38	41	41	39	38	37	36	36	36	37	37	38	922	38.4	43	36
21	38	37	38	40	42	42	40	42	40	40	40	40	40	44	45	45	50	47	44	40	44	43	44	44	1009	42.0	50	37
22	44	43	46	47	45	47	46	50	46	46	45	46	48	46	44	46	45	44	41	45	46	47	50	48	1101	45.9	50	41
23	46	45	47	49	46	46	46	47	51	52	54	55	55	52	53	54	52	50	49	48	43	46	42	40	1168	48.7	56	40
24	43	43	41	40	43	43	45	45	46	45	45	45	44	43	42	43	44	45	45	45	44	42	45	45	1051	43.8	46	40
25	45	45	44	45	45	45	45	45	45	45	46	46	46	46	46	46	46	44	44	44	44	44	43	41	1075	44.8	46	41
26	41	41	42	42	44	43	45	47	46	49	47	48	50	48	46	47	46	45	45	44	44	45	46	48	1089	45.4	50	41
27	48	50	52	46	46	46	44	44	43	43	43	42	42	42	42	42	42	41	41	41	40	40	40	40	1010	43.3	52	40
28	40	40	40	40	40	40	40	40	41	42	43	43	44	45	44	45	46	45	45	45	44	44	43	43	1022	42.6	46	40
29	42	42	42	42	42	42	42	42	42	43	43	43	44	45	46	47	48	47	47	48	47	47	46	46	1065	44.4	48	42
30	48	48	49	50	48	48	46	46	45	45	45	45	45	45	44	44	43	42	42	41	41	42	42	42	1076	44.8	50	40
31	41	41	41	42	43	44	45	45	45	45	43	42	43	43	45	45	44	44	44	44	44	44	44	44	1045	43.5	46	41
S'ms	1253	1251	1250	1260	1261	1255	1270	1289	1293	1298	1311	1311	1312	1313	1305	1310	1302	1287	1270	1263	1258	1265	1274	1269	30731	.....	1424	1161
M'ns	40.4	40.4	40.3	40.6	40.7	40.5	41.0	41.6	41.7	41.9	42.3	42.3	42.3	42.4	42.1	42.3	42.0	41.5	41.0	40.7	40.6	40.8	41.1	40.9	41.3	.....	45.9	37.5

AUGUST.

1	43	43	43	43	43	43	42	42	42	41	38	36	36	36	36	36	36	36	36	36	36	36	35	35	929	38.7	44	35
2	34	33	33	33	33	33	34	35	35	36	36	37	37	38	39	39	39	39	40	40	40	40	40	40	884	36.8	40	33
3	39	39	39	39	40	40	41	41	42	42	43	43	44	45	46	46	44	43	42	42	42	42	42	42	1008	42.0	46	39
4	42	42	41	41	40	38	38	39	40	40	40	43	41	41	41	41	42	41	41	41	41	41	40	40	975	40.6	43	38
5	41	41	43	43	43	43	43	43	43	43	43	43	43	43	42	43	42	42	41	41	40	40	40	39	1008	42.0	43	39
6	39	39	39	39	39	39	39	39	39	39	40	40	40	40	40	40	40	40	39	39	38	38	37	37	938	39.1	41	37
7	37	37	37	37	38	38	39	39	40	40	41	41	43	43	41	41	41	40	40	40	38	38	38	38	945	39.4	43	37
8	40	40	40	40	40	40	40	40	42	40	40	40	39	39	39	39	35	38	35	36	43	45	44	45	959	40.0	45	35
9	44	45	45	45	45	45	43	41	40	40	39	39	38	38	38	38	38	38	37	37	37	37	37	37	961	40.0	45	37
10	37	37	37	37	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	868	36.2	38	36
11	36	36	36	36	36	36	35	34	35	36	36	36	36	36	36	36	36	38	38	38	38	37	37	37	871	36.3	38	34
12	36	36	36	36	36	35	35	36	37	38	39	39	40	40	41	40	38	37	37	37	37	37	37	37	897	37.4	41	35
13	37	37	37	37	37	37	37	37	37*	35*	35*	35*	35*	35*	35*	32*	32*	34	32*	32*	32*	32*	32*	32*	835	34.8	38	32
14	32*	32*	32*	32*	32*	32*	34	34	34	34	34	34	34	34	35	36	35	34	32	32	34	34	34	34	804	33.5	36	32
15	34	34	36	36	36	36	36	36	37	38	39	39	39	39	39	39	39	40	40	40	40	40	40	40	912	38.0	40	34
16	38	38	38	38	38	38	38	38	39	39	39	39	39	39	39	39	39	40	40	40	40	40	40	40	935	39.0	40	38
17	40	39	39	39	39	39	39	40	40	39	38	38	38	38	38	38	37	37	37	37	37	37	37	37	917	38.2	40	37
18	37	37	37	37	37	37	36	36	36	36	36	36	36	36	37	37	38	38	37	37	37	37	38	38	884	36.8	38	36
19	38	38	38	39	40	41	42	43	44	45	46	46	47	47	46	46	45	44	44	44	43	43	42	40	1031	43.0	47	38
20	38	38	40	40	40	40	40	40	40	41	48	48	48	48	47	46	45	44	45	45	45	45	44	44	1039	43.3	48	38
21	44	44	43	44	44	45	46	46	47	47	48	48	48	48	48	48	45	43	38	37	37	36	35	35	1031	43.0	48	35
22	35	35	35	36	36	36	37	37	37	37	37	37	37	38	38	38	39	38	39	39	39	39	39	39	897	37.4	39	35
23	39	39	39	39	39	39	39	39	39	39	39	40	40	41	39	39	38	37	37	37	36	36	35	33	917	38.2	41	33
24	32	32	32	32	32	32	33	33	34	34	34	37	38	38	39	38	37	36	36	36	36	36	35	35	838	34.9	39	32
25	36	36	37	38	37	37	35	35	34	34	34	34	34	34	34	34	34	36	36	36	35	35	34	34	843	35.1	38	34
26	33	33	33	34	34	34	34	34	35	35	36	36	37	37	38	38	37	36	36	35	34	33	33	32	837	34.9	38	32
27	33	32	32	31	31	30	29	28	28	27	27	27	27	27	27	27	27	32	32	32	31	31	29	29	706	29.4	33	27
28	29	29	29	28	28	28	29	29	29	30	30	30	30	31	31	31	31	32	32	32	32	32	32	31	725	30.2	32	28
29	31	31	32	32	31	31	30	30	30	29	29	29	29	29	30	30	31	32	32	32	32	32	32	32	738	30.8	32	29
30	32	32	32	32	32	32	32	32	33	33	33	33	33	33	33	33	33	32	32	32	32	32	32	33	778	32.4	33	32
31	32	32	32	32	32	32	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	748	31.2	33	30
S'ms	1138	1136	1142	1145	1144	1142	1142	1143	1156	1156	1163	1169	1173	1178	1179	1172	1157	1160	1149	1149	1148	1147	1138	1132	27658	.....	1240	1067
M'ns	36.7	36.6	36.8	36.9	36.9	36.8	36.8	36.9	37.3	37.3	37.5	37.7	37.8	38.0	38.0	37.8	37.3	37.4	37.1	37.1	37.0	37.0	36.7	36.5	37.2	.....	40.0	34.4

SEPTEMBER.

1	30	30	30	30	30	30	30	30	30	29	29	29	29	29	30	30	30	29	29	29	29	29	29	30	709	29.5	30	29
2	30	30	30	30	30	30	30	30	31	32	33	34	35	35	35	35	35	34	34	34	34	34	34	34	783	32.6	35	30
3	34	34	34	34	34	34	34	34	34	34	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Interpolated; self-register not working.

TABLE 3.—*Hourly wind movement at Camp Wellman, Danes Island, Spitzbergen, from June 26 to August 31, 1906. (Standard of time in local use, 15th meridian east).*

JUNE.

Date.	A. M. 0 to 1.	1 to 2	2 to 3.	3 to 4.	4 to 5.	5 to 6.	6 to 7.	7 to 8.	8 to 9.	9 to 10.	10 to 11.	11 to 12 noon.	P. M. Noon to 1.	1 to 2	2 to 3.	3 to 4.	4 to 5.	5 to 6.	6 to 7.	7 to 8.	8 to 9.	9 to 10.	10 to 11.	11 to 12 midn't.	24 hours. Total.	Max. vel.	Direct'n.	Prevailing direction for the day.
26....	7	9	8	7	5	5	5	3	6	4	4	5	4	5	3	3*	3*	2	2	2	1	8	8	8	117	12	n.	.....
27....	7	7	6	7	6	7	6	8	7	8	7	9	8	7	9	10	8	6	6	7	8	6	6	8	174	10	ne.	.....
28....	6	7	6	7	8	7	7	7	8	8	8	7	7	8	9	8	8	7	6	8	7	9	10	11	184	12	ne.	.....
29....	9	9	9	9	10	9	8	9	10	10	10	9	11	12	11	8	9	9	8	9	9	9	8	7	221	12	ne.	.....
30....	7	8	9	9	9	8	7	7	9	8	7	12	8	9	9	10	10	8	8	7	8	7	7	7	198	13	n.	.....

*Estimated.

JULY.

1....	7	6	7	7	7	7	6	6	5	10	7	7	6	6	9	11*	10*	8	7	7	6	6	6	6	170	13	ne.	ne.
2....	5	5	5	4	8	5	5	4	5	3	5	5	6	7	9	8	10	7	7	6	3	2	0	2	126	14	sw.	e.
3....	0	1	3	10	10	12	3	6	9	7	2	3	6	10	7	8	14	15	13	14	12	11	10	9	195	18	sw.	s.
4....	7	9	7	5	6	6	11	9	9	10	10	15	14	15	14	14	14	17	14	13	13	13	17	16	278	22	sw.	sw.
5....	12	14	16	14	14	15	15	15	17	16	14	12	9	10	12	9	6	5	3	2	4	4	4	3	245	20	s.	s.
6....	4	3	4	3	2	1	1	0	1	1	1	8	5	6	6	6	4	5	5	8	9	13	8	10	114	15	sw.	s.
7....	9	12	13	17	17	15	14	16	14	12	17	14	21	16	22	23	22	10	10	7	7	6	4	10	328	24	s.	s.
8....	17	21	21	19	22	21	16	16	13	12	10	4	2	2	1	6	3	3	2	2	2	2	1	2	220	24	s.	s.
9....	4	4	1	3	3	3	4	6	7	4	5	4	3*	3*	13*	15*	10*	13*	13	8	5	3	2*	4*	140	28‡	sw.	e-sw.
10....	4	5	4	4	2*	2	1	2	3	2*	2*	6	4	6	11	8	4	4	7	5	7	4	5	4	106	13†	sw.	e.
11....	6	4	4	2	4	9	14	17	12	9	10	9	9	10	8	14	9	9	10	10	9	8	9	10	215	18	s.	s.
12 ..	11	11	15	11	10	6	4	5	8	7	8	9	12	13	5	4	4	6	5	6	5	4	4	4	177	16	s.	s.
13....	5	4	2	3	4	3	3	6	5	4	4	4	7	12	11	11	12	13	14	13	13	12	12	11	188	16	n.	ne.
14....	11	12	12	11	7	12	12	12	15	13	15	13	16	14	13	11	12	15	11	10	9	12	16	11	295	19	n.	n.
15....	10	10	11	8	16	16	12	12	12	16	17	11	13	15	19	19	12	8	10	11	9	7	5	6	285	24	n.	n.
16....	3	5	4	2	2	4	3	3	4	2	2	3	4	3	3	2	4	4	4	4	2	2	2	2	73	6	n.	n.
17....	1	2	3	2	1	1	2	2	4	4	2	4	6	9	17	15	13	16	14	17	16	14	10	18	193	22	n.	n.
18....	20	16	15	24	26	23	12	9	8	6	5	4	9	15	18	16	13	5	7	5	4	5	4	5	274	29	n.	n.-s.
19....	3	8	10	12	16	17	12	17	9	13	24	27	24	21	24	28	27	26	22	20	24	17	20	18	442	30	ne.	ne.
20....	20	20	19	18	22	26	22	26	23	26	24	21	23	20	13	13	14	16	12	9	9	12	13	10	431	30	ne.	ne.
21....	11	10	6	9	8	14	21	21	24	22	21	23	28	26	22	18	18	16	12	18	7	4	3	2	364	30	n.	n.
22....	3	3	3	2	4	2	2	5	7	6	4	5	4	10	10	10	15	17	10	7	7	5	2	2	145	18	n.	n.
23....	2	1	3	3	2	1	3	4	2	4	4	5	5	6	8	8	8	8	15	16	10	5	5	4	132	20	s.	s.
24....	14	21	23	20	21	19	17	21	15	22	18	20	19	17	17	14	16	16	15	16	16	18	8	10	413	28	s.	s.
25....	14	15	12	8	7	7	7	7	6	5	5	5	6	5	6	5	9	10	6	4	4	3	4	3	163	18	s.	s.
26....	1	2	2	2	3	4	3	3	3	9	7	5	7	6	7	4*	4*	4*	5*	6	4	5	7	8	111	18†	s.	s.
27....	5	3	19	18	9	10	10	10	9	5	4	8	11	10	11	10	12	11	7	7	6	10	6	8	219	26	s.	s.
28....	9	9	12	12	10	10	10	11	8	6	7	6	6	5	6	5	5	5	5	5	7	7	7	7	180	14	s.	s.
29....	10	9	11	9	8	10	9	9	10	12	9	8	7	6	6	5	5	4	5	6	5	7	7	7	184	13	s.	s.
30....	9	7	6	6	7	7	7	8	13	9	12	13	14	14	12	11	9	8	7	6	5	3	4	2	199	17	s.	sw.
31....	3	3	3	2	2	3	4	5	6	8	9	9	9	7	9	6	5	6	5	4	5	4	5	4	126	12	sw.	sw.
S'ms.	240	265	276	270	280	291	265	293	286	285	284	290	315	328	349	337	323	310	282	272	244	228	210	218	6731	.....	.....	.....
M'ns.	7.7	8.5	8.9	8.7	9.0	9.4	8.5	9.5	9.2	9.2	9.2	9.4	10.2	10.6	11.3	10.9	10.4	10 0	9.1	8.8	7.9	7.4	6.8	7.0	217.1	.....	.....	.....

* Estimated. ‡ For 20 hours. † For 21½ hours. Average hourly velocity, 9.0.

AUGUST.

1....	7	8	5	7	6	5	5	6	3	5	5	4	4	4	4	4	4	3	4	4	4	3	3	4	111	8	sw.	n-ne.
2....	4	2	3	2	3	2	3	3	3	3	4	4	4	4	3	5	4	4	3	2	3	3	5	6	81	7	s.	s.
3....	9	9	7	8	7	7	7	8	10	9	8	9	9	8	8	13	13	10	9	6	6	3	2	2	187	17	sw.	sw.
4....	3	1	2	1	3	4	3	3	2	2	2	3	2	2	2	2	2	3	3	2	2	2	4	4	59	6	nw.	s.
5....	3	3	3	3	3	3	2	3	3	3	3	3	2	3	2	2	2	2	2	3	2	2	2	1	59	4	sw.	Var.
6....	2	2	2	2	2	3	2	2	3	2	3	3	3	3	3	2	2	3	2	1	3	2	2	2	56	4	s.	Var.
7....	3	2	3	3	3	3	5	5	6	7	7	5	4	5	9	7	7	7	5	7	5	6	3	4	121	8	s.	s.
8 ..	3	4	3	2	3	3	3	2	4	3	4	3	3	4	2	3	4	3	4*	4*	3*	2*	3	1	73	6	n.	n.
9....	2	2	3	2	3	2	3	3	5	4	6	5	6	4	4	5	6	4	5	3	2	3	3	4	89	8	nw.	nw.
10....	3	3	3	3	4	3	5	3	4	4	4	2	2	2	4	3	3	2	3	2	3	3	2	2	72	5	nw.	w-n.
11....	2	2	2	3	2	3	3	5	5	5	7	9	7	7	7	9	8	6	6	7	7	7	8	8	135	11	n.	n.
12....	8	9	9	8	9	9	8	8	8	7	5	4	2	2	4	2	2	3	2	2	3	3	2	2	121	11	n.	n.
13....	1	0	2	1	2	1	2	2	3	2	2	3	2	4	3	3	3	3	3	3	3	4	3	3	58	4	sw.	Var.
14....	3	3	3	3	2	3	3	3	3	4	3	5	4	4	4	6	4	3	3	3	2	3	4	4	81	7	sw.	Var.
15....	5	4	4	3	5	2	2	2	3	4	3	3	3	3	4	3	3	3	1	2	2	2	2	3	71	6	sw.	s.
16....	3	2	2	1	2	1	1	1	0	2	3	3	2	3	2	2	2	2	2	2	1	2	1	1	43	3	s.	Var.
17....	1	2	2	2	1	1	2	1	2	1	1	2	1	2	1	2	2	2	2	2	2	2	2	2	40	3	s.	s.
18....	3	3	3	2	3	3	2	4	3	4	5	4	6	5	5	4	6	5	5	4	5	4	3	3	94	6	n.	n.
19....	4	3	3	3	3	3	2	4	2	2	3	3	2	2	2	2	2	2	2	2	1	2	1	0	55	4	se.	se.
20....	1	2	2	2	2	2	1	1	2	0	1	1	2	2	2	3	2*	1	1	1	3	1	0	0	35	3	w.	Var.
21....	1	0	1	1	1*	0	2	1	2	1	1*	1	2	3	2	3	1	2	2	3	2	1	1	2	36	4	e.	Var.
22....	1	0	2	2	2	2	1	3	2	2	2	1	2	2	2	3	3	1	2	1	2	1	2	1	42	3	se.	Var.
23....	2	2	2	1	1	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	1	2	1	2	46	4	sw.	Var.
24....	1	2	0	2	1	2	3	1	3	2	2	2	3	2	3	3	3	3	3	3	2	2	1	1	50	3	w.	ne.
25....	1	2	0	2	2	1	1	2	2	3	5	3	3	4	5	6	7	5	6	5	5	6	7	6	89	10	sw.	s.
26....	7	9	9	7	6	9	9	7	7	6	7	10	10	8	3	3	6	4	17	17	17	15	14	16	223	20	ne.	s-ne.
27....	18	16	18	18	17	17	18	18	17	17	19	18	16	17	16	17	14	17	16	15	15	15	15	16	400	22	ne.	ne.
28....	15	16	15	14	9	11	13	15	14	14	15	16	18	17	13	14	13	12	12	14	15	14	14	12	335	19	ne.	ne.
29....	12	14	15	14	14	14	12	12	10	9	11	7	9	11	6	5	1	2	1	2	1	2	6	4	194	19	ne.	ne-w.
30...	3	2	5	4	7	4	8	4	3	3	2	3	2	4	5	9	11	7	5	4	5	4	5	3	112	14	w.	w.
31....	3	6	5	4	4	6	8	8	6	7	7	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69‡	10‡	w.	w.
S'ms.	134	135	138	130	132	131	141	142	142	138	153	144	138§	143½	132½	145½	144½	127§	133§	128½	128§	120½	120½	119½	3237†	.....	.....	.....
M'ns.	4.3	4.4	4.5	4.2	4.3	4.2	4.5	4.6	4.6	4.5	4.9	4.6	4.6§	4.8§	4.4½	4.8½	4.8½	4.2§	4.4§	4.3½	4.3§	4.0½	4.0§	4.0§	106.1†	.....	.....	.....

* Estimated. § For 30 days. † For 30¼ days. ‡ For 12 hours. Average hourly velocity. 4.4.

This was the first taste of real winter. Lamp was lighted in the house for the first time this evening.[2] This was needed on account of the cloudiness and the fact that the sun disappears behind the mountains in the west and north on Amsterdam Island. Snowfall at 6 p. m. measured .15 inch.

August 28.—Light snow during the preceding night followed by cloudy with brisk northeast wind. Light snow flurries at intervals from 10 a. m. to 2 p. m. Temperature below freezing all day.

August 29.—Cloudy, cold weather with brisk northeast wind in the forenoon, becoming light in the afternoon. Traces of rain and snow at intervals until 2 p. m., the rain freezing as it fell. Heavy snow flurry, 3:30 p. m. to 3:45 p. m., followed by occasional lighter ones. Wind became light and shifted to west about 2:30 p. m. Snow on ground at 6 p. m., 1 inch.

August 30.—Cloudy with occasional snow flurries. Light westerly wind.

August 31.—Snow continued all night with temperature below freezing. Snow 4 inches deep at 7 a. m. Snow flurries at intervals all day with fresh westerly wind. Snowfall for preceding twenty-four hours at 6 p. m., 6 inches; depth on ground, 5 inches.

The expedition departed from Danes Island on September 4, 1906, leaving the instruments in charge of Mr. Felix Riesenberg, who will continue the meteorological observations thruout the year. The meteorograph, however, was brought back to Paris and left with Richard for repairs.

A CLIMATIC SKETCH OF TACOMA, WASH.

By E. B. GITTINGS, jr., Assistant Observer. Dated Tacoma, Wash., February 27, 1907.

The object of this sketch is to present in popular form as complete a description of the climate of this station as is possible without the introduction of extensive tabular compilations of data. To the ordinary reader nothing can be less interesting than column after column of figures. It is true that these figures are very necessary to the complete understanding of a climate in all its varied phases. Still it is believed that by presenting and briefly describing the most important features to be found in the tables it is possible to convey to most people a much better general knowledge of the climate of a place than they would be able to gain for themselves, even if they were patient enough to delve into the figures.

The records on which this paper is based are those of the Weather Bureau from May 1, 1897 (on which date this station was established) to January 31, 1907, so that while the period covered lacks three months of a full ten years, yet it includes ten Januarys and ten Julys. The subject will be treated under the following heads: Rainfall, temperature, and miscellaneous conditions (including sunshine, cloudiness, etc.).

RAINFALL.[1]

As the rainfall is perhaps the most interesting phase of the climate of this section it will be treated first. Among the important things to know about rainfall are the total amount that falls annually and the distribution of the annual amount among the different seasons, the latter especially when the distribution is very unequal, so that there are a wet season and a dry season, as is the case at this station. Next, considering each season separately, we wish to know, in addition to the seasonal distribution of the total annual rainfall, the following particulars: The period of time over which each season extends, and the greatest number of consecutive rainy days and of days without rain that usually occur in each. Subdividing the seasons into months and considering these separately, it will be of interest to determine the intensity and the probability of rainfall for each month.

As a description of rainfall is incomplete without mention of its special features, attention will also be given to the frequency and intensity of excessive monthly and daily rainfalls, and (since it is not of sufficient importance at this station to be considered separately) some information concerning the snowfall will be given.

Annual and seasonal rainfall.

The average annual rainfall at Tacoma is 45.36 inches, the greatest amount recorded in any one year being 54.67 inches, the least amount 35.58 inches. Of the average annual amount 34.15 inches, or 75.3 per cent., falls from October 1 to April 1, so that the wet season may be said to cover the six months beginning with October and ending with March, the other six being the dry season. The average monthly amounts for the wet season range from 3.30 inches in October and 3.91 inches in March to 8.67 inches in November and 7.08 inches in December; for the dry season the range is from .64 inch in July and .59 inch in August to 2.91 inches in April and 2.52 inches in September. These figures show that the rainfall in November and December is copious and that July and August are almost rainless.

Wet and dry periods.

Defining a rainy day as one on which .01 inch or more of rain falls, we may expect annually 162 rainy days. As a rule, there will be 9 or 10 consecutive rainy days in each month from November to February, inclusive. The longest rainy period on record for the rainy season is 23 days; the longest period without rain in measurable amounts is 15 days. During the dry season there will, as a rule, be only 2 consecutive rainy days in July and August and 4 consecutive rainy days in each of the other four months. The longest rainy period recorded for the dry season is 9 days; the longest period without rain is 39 days.

Intensity and probability of rainfall.

If we divide the average amount of rainfall in inches during any month by the average number of rainy days in the month, we obtain what is known as the average intensity of rainfall in inches for a day in that month. In the wet season the intensity varies from .25 in October and .24 in March to .35 in December and .41 in November. In the dry season the range is from .16 in July and .15 in August to .22 in April and .25 in September, the decimal representing the fraction of an inch in each case.

By dividing the number of rainy days in any month by the number of days in the month we obtain the probability of rainfall for that month. In the wet season the probability exprest in percentage ranges from 42 per cent in October and 52 per cent in March to 65 per cent in December and 70 per cent in November; in the dry season the range is from 13 per cent in July and August to 33 per cent in September and 43 per cent in April.

Excessive rainfalls.

When 10 inches or more of rain falls in a month the rainfall for that month is considered excessive; for 24 hours a fall of 2.50 inches or more is excessive; and for a single hour a fall of 1 inch or more is excessive.

During the past ten years there have been seven months when the rainfall was excessive, five Novembers and two Decembers, the greatest monthly fall on record being 14.48 inches in December, 1897. There have also been five excessive daily rainfalls, the heaviest 24-hour fall being 3.79 inches in November, 1904. A fall of 1 inch in a single hour has never been recorded.

Snowfall.

The average annual snowfall at Tacoma is 15 inches. As a

[2] See footnote [1], under June 21.

[1] Thruout this article whenever the writer uses the expression "rainfall", he evidently includes the amount of melted snow, if any.